

CASH CROPS AND FOOD SECURITY

Cash Crops, Household Food Security and Nutrition¹

Richard Longhurst

This article examines two main questions: what does the available evidence reveal about the impact on household food security and nutrition of a shift from semi-subsistence to cash cropping? Does this evidence, used together with present analytical frameworks, allow us to develop any predictive ability or typologies as to the impact on food consumption and nutrition of specific types of crops in different policy situations?

The article is divided into four sections. In the first, frames of analysis are discussed with some reference to economic theory that might be applied to the choice and impact of cash crops. This is followed by a review of data on the impact of cash crops on household food security and nutrition. These two sections are then used to propose predictive typologies or scenarios in the third section. Finally, a concluding section reviews the policy implications.

I. Cash Crops and Nutrition: Frames of Analysis

Any interpretation of the impact of cash crops has to be made with care. The choice of indicator involves three sets of factors. The first is the food adequacy or nutritional status indicator. Measuring food consumption involves substantial resources, especially to control for the effect of seasons. Measuring nutritional status (e.g. anthropometric measures of young children), is easier for larger numbers of subjects and partly reflects food consumption and income changes in the household; however, it also reflects the infective conditions around and within the household. Food adequacy or nutritional status may relate only to individuals.

There is a second set of indicators of income or consumption relating to the household which can be expressed in terms of consumption units; third is the means of identifying the importance of cash crops in the household, be it by proportion of land area, labour days or share of income. Because all three factors on different axes can be measured in different ways it is not surprising that the results are not clearcut. Also, each indicator can operate at four levels of analysis:

¹ This article benefitted from discussion at the IDS Cash Crops workshop, and in particular from comments by Reg Green, Michael Lipton (special thanks as the paper's discussant) and Simon Maxwell. The usual absolutions apply.

household, village, region and nation.

There are complex linkages between cash crop production, household income and food intake and allocation within households. Unravelling these can be difficult, even under 'normal' circumstances, but when the household is transferring to new economic activities, unexpected effects can occur. These worries about inadequate data and elusiveness of appropriate indicators should be borne in mind when the following four frames of analysis are presented. Two have been directly applied to cash crops and nutrition [Pinstrup-Anderson 1983, Schofield 1979] and two others have not [Katona-Apte 1983, and Boserup 1970], but since they are related to predicting women's work and income control outcomes, they are used speculatively here to see how far they add to our efforts to formulate suitable analysis.

The major call for a fresh look at cash crops and nutrition has come from Pinstrup-Andersen (1983), who reasserts the importance of comparative advantage as a criterion for agricultural production patterns linked to an understanding of the distribution of the associated economic benefits in terms of how they affect nutrition variables. He identifies four elements in the cash crop/food security nexus: (i) availability of food; (ii) ability of the household to obtain food; (iii) desire of the household to obtain food, and (iv) intra household distribution of food. The following paragraphs offer a precis of Pinstrup-Andersen's reasoning [1983:10-11]:

First, food *availability* can influence nutritional status mainly through food prices; expanded export crop production need not reduce food availability if the foreign exchange generated leads to increased food imports *and* if these are effectively distributed. At local level, land and other resources can be shifted out of staple into cash crop production, leading to pressure on food prices. Net food buyers and the landless will experience harmful nutritional effects unless the marketing and transportation systems are effective. Expanded cash crop production can also affect food availability by reducing the diversity of food products (especially if an all or nothing technological package has to be adopted) and might increase the risk of crop failure. Generally, the farmer becomes more dependent on external economic forces.

Second, Pinstrup-Andersen regards the impact of cash crop production on poor households' *ability to acquire*

food as the main determinant of its nutritional impact — in line with the food entitlements debate of recent years. Higher incomes at household level as a result of changing crop production patterns should lead to positive nutritional benefits, but these are often mitigated: first, by food prices higher than imputed prices for own production due to marketing costs (see the discussion of Franklin and Harrell (1985) at the end of this section); second, by the potential for increasing food prices; and third, by the lumpy nature of cash payments from (some) cash crops. In addition, there may be falls in cash crop returns if the prices of imports essential to production, e.g. fertiliser, rise. These income-price uncertainties are increased by the shift to cash crops, especially if they have a long maturation period, as is the case with tree crops. It is in this transitional period that negative nutrition effects can be pronounced [Fleuret and Fleuret 1983], often compounded by seasonality, if land and labour are diverted from food crop production. Export crops can generate employment, but for some crops labour saving mechanisms will already have been developed as part of a technological package.

Third, shifts to cash crop production can influence the *desire to acquire* food and household spending behaviour through five factors: (a) intrahousehold income; (b) income composition; (c) perceived and real access to goods other than staple foods; (d) time constraints; (e) nutrition awareness [Pinstrup-Andersen 1983:11]. Expanded cash cropping can reduce women's control over household resources if cash crops are traditionally in the domain of men; there is evidence [Kumar 1977] to suggest that notional incomes in the form of own production safeguard food consumption more than an equivalent amount of income generated by growing cash crops. The amount of time available to women for child-care may decrease if there are pressures on domestic food supply, for example, extra search costs for food. Also, the introduction of cash crops may increase the value of time, so that the implicit cost of subsistence production increases (a point also emphasised by Franklin and Harrell (1985)). Any big shift in the food bundle consumed will require an increase in nutritional knowledge to cope with nutrition needs.

Finally, the *intra-household distribution* of food, as influenced by the five factors mentioned above, has particular importance for the nutritional needs of children. In some cases a shift away from semi-subsistence crops such as roots and tubers towards bought foods can provide more energy dense foods important for children. However, if these foods are processed, packaged and promoted, it is possible that the per calorie cost of bought foods would be higher. Pinstrup-Andersen's four categories form a good basis for examining the effects of cash crops on nutrition, although in any such categorisation, interactions cannot be ignored. Also, during the period of cash

crop adoption, many things can happen to unravel the expected effects: household calorie requirements can go up and down according to labour and input or infective episodes, household size and composition can change through migration, and the differentiation process induced by cash crop adoption is a major factor. There also seems to be the implicit assumption that food crops and cash crops are competitive: this need not be so if cash crops enter a rotation or are otherwise complementary, such as trees in agro-forestry systems.

Schofield's analysis was one of the first attempts to predict the impact of cash crops on nutrition, using survey data as part of her broader work on whether the nature of village nutrition could be predicted on the basis of its main crop grown [Schofield 1979]. She examined nutrition surveys in 33 Latin American and 29 African villages, classifying them into one of three economic groups: (1) pure subsistence villages, which produce almost all the food they consume and neither market nor purchase major amounts of crops or foods; (2) semi-subsistence villages which sell part of their subsistence food crop and purchase food with either the income or alternative sources; and (3) semi-cash crop villages which produce both cash and subsistence crops, marketing either or both, and buy some but not all of their food. Cash crops were defined as those products being either non-edible, an unimportant nutrient source or generally absent from the subsistence diet [Schofield 1979:64].

In the Latin American sample, dietary differences based on nutrient intakes between the three groups of villages were not significant. In the 29 African villages, dietary differences were found to be statistically significant, with nutrient intakes (except for vitamins A and C) being higher in pure subsistence villages than in other types. Energy intake was higher in semi-cash crop than in semi-subsistence villages. The amalgamated sample of 62 villages showed dietary differences between the three types (significant at the 0.1 per cent level), with nutrient intakes being higher in the pure subsistence villages and lowest in semi-cash crop villages. However, in terms of percentage adequacy of intake, the differences were not statistically significant [Schofield 1979:67]. Schofield suggests that pure subsistence villages are better fed than those which perhaps 'oversell' subsistence crops or cultivate cash crops at the expense of subsistence crops. The intake data used were per capita averages derived at village level, with no indication of intra-household intakes.

The participation of women in farm and market activities is an important element in household economics, and will be discussed at the end of this section. The control women have over income sources is also important in evaluating the impact of cash crops on nutrition, but this may prove to be more difficult to model. Therefore the analytical framework

suggested by Katona-Apte (1983) which considers both of these factors, may be very relevant. As this was prepared with a view to analysing the impact of agricultural projects on nutrition, some modifications for application to cash cropping may be necessary. She distinguishes between three different types of rural society on the basis of degree of female participation in agricultural labour: in the first (Type 1) women do not participate (an example might be in several Muslim societies where women are secluded), in the second (Type 2) women do participate (e.g. in many areas of sub-Saharan Africa) and in the third (Type 3) women work separate fields and crops, as in particular societies in Africa such as the Gambia. Katona-Apte identifies three problems that can be caused by the introduction of an agricultural project, and all may also come about as a result of shifts from subsistence to cash crops. These three problems are: (a) nutritionally undesirable expenditure patterns resulting from changes in cash control in the household; (b) changes in the perception in food needs within the household; (c) changes in the time available for household functions.

We are interested in cash control because who controls it has the greatest influence on how it is to be spent; greater control by women suggests a better nutritional impact. In Type 1 societies, where women contribute little or nothing towards the family farm income, cash cropping would not lead to changes due to cash control alone. When the control over income generation is shared (as in Type 2 societies), and if there is no competition for cash control, agricultural projects (in our case, cash cropping) have the potential for positive nutritional change. When there is separate control (Type 3), women are at a disadvantage because men usually grow the cash crops and receive all the necessary inputs to develop them.

Perception of food needs for different family members is important when the source of food supply changes. In Type 1 societies, a woman, not participating in agricultural labour, may perceive increased needs for men if production increases; in Type 2 societies the woman perceives increased needs for both of them. In Type 3 societies a woman, if in a polygamous society and responsible for feeding herself and her children but sharing feeding her husband, may believe that if her husband is involved in increased agricultural production (and therefore less hunting) he needs higher status foods.

Finally, if a project leads to changes in time availability for household work, women in Type 1 societies are unaffected. In Type 2 societies women may work longer in the fields and have less time in the household; in Type 3 societies, where women work independently and an agricultural project passes them by, they may not be affected. These predicted outcomes are summarised in Table 1.

The usefulness of this typology, which is a brave attempt to bring together a number of diverse circumstances, and its adaption here to cash cropping, is debatable. Certainly, examples can be given where the hypothesised impact would not occur. Cash cropping causes such a succession of events that to examine the effect of isolated factors may not be helpful. But three points stand out.

First, it is important to note in this typology the significance of household time availability and how in none of the three societies does this increase with the introduction of an agricultural project. Second, in societies where women have some independent source of income (Type 3), all three problems can lead to diminished or unchanged nutrition. Third, there are general points about the nature of the three societies that help in understanding the ways in which cash crops might be introduced and the compensatory devices required. According to Katona-Apte, these are that Type 1 societies are mostly in need of general health and nutrition programmes, aimed at men in the absence of women being able to gain some control over income; Type 2 societies are characterised by problems of time availability, so that extra time allocated to agriculture can negatively affect food preparation and child-care; compensatory devices might therefore be ready-made nutritious foods, or child-care facilities. In Type 3 societies cash control is important: women should be included in any cash crop or cash generating programmes.

These distinctions between rural societies according to women's participation in agricultural production systems relate closely to Boserup's (1970) typology of subsistence cultivation as it affects women's status. She classifies societies where women participate in farming systems as those most prevalent in Africa where there is abundant land, low population density, shifting cultivation and the use of the hoe in cultivation. Food production is the major responsibility of women and women have a high degree of mobility, the ability to market their surplus and therefore acquire cash, and with it the responsibility of supporting themselves and their children with some support from their husbands. This would correspond to Type 2 and Type 3 societies in Katona-Apte's typology. On the other hand, male farming systems, more characteristic of Asia, are under higher population pressure with use of draught animals and plough. Women do no agricultural work and depend entirely on men (Katona-Apte's Type 1 society).

Criticisms of Boserup's approach suggest that 'women's systems' are still male dominated and that women remain trapped and burdened by both farm and household work, as well as child rearing.

The general conclusion to draw from the Katona-Apte and Boserup typologies is that in societies where

Table 1

Impact of Agricultural Projects/Cash Cropping on Determinants of Nutrition in Households, according to Female Participation in Agricultural Labour

<i>Extent of female participation in agricultural labour</i>			
	<i>Type 1</i>	<i>Type 2</i>	<i>Type 3</i>
Determinants of Household Nutrition	<i>Women do not participate</i>	<i>Women do participate</i>	<i>Women work on separate fields and crops</i>
Cash control by women	No change	No change or increased control	decreased control
Perception of food needs by women	increased amounts for males	no change	increased high status food for males
Time availability for household functions	no change	decreased	no change

Source: Adapted from Katona-Apte, 1983

women participate in agricultural work and have income sources, the opportunities for household food security and nutrition to benefit from cash crops are greater, but so are the risks that households will be harmed. A dynamic and complex system of separate income sources and flows and allocation of labour time to market and non-market work has to be understood and harnessed. In households where women do not participate, a resource flow has to be introduced with the opportunities for success or failure equally less apparent.

It should be possible to model the effects of cash crops² on nutrition within poor rural households, and the most helpful approach is through household economics. Household economics recognises that home production processes produce goods that are generally not market goods, but are economic in that they utilise resources which have real costs in so far as they could be devoted to alternative income generating processes:

Home goods such as 'child services' which are produced from market goods (food, medicine, clothing, etc.) and home production time (child care, food preparation, etc.) can be accommodated within these models . . . In the new home economics

perspective, home resources (time and capital) receive implicit factor payments, and the value of home goods consumed in a household exceeds the value of the market goods used in their production by the value of these home resources. This expanded definition of income is referred to as 'full income' [Evenson 1981:181].

It is not the intention here fully to critique the value of this approach but to stress the importance within it of time allocation, making it relevant to poor households in the choices they make over production and consumption activities. It also involves the decisions of husband and/or wife to enter market activities, and the effect of children on these decisions. Research in the Philippines has already shown the considerable relevance of household economics in these choices as they determine nutritional status [Evenson 1978; Evenson, Popkin and King-Quizon 1980; Evenson 1981; Popkin 1980]. An important application of this to the linkage of cash crop production with nutrition now follows.

Recent research in Panama has directly applied a household economic theory to predict household production and consumption behaviour with data from a cross sectional survey of 30 rural communities in Veraguas Province [Franklin and Harrell 1985]. Rural households were assumed to be able to produce food for their own consumption, sell agricultural products to the market, and sell labour services to the market as well as buy labour services from the labour market. Resources could be allocated therefore to nurturing activities and to production activities which

² Michael Lipton has suggested that a simple model might be developed along the lines of three types of crops: (a) those that have to be consumed on the farm or locally, e.g. yams, (b) those that can be consumed locally or sold into the city, e.g. groundnuts, and (c) those that cannot be processed at home and have to be sold, e.g. cotton. It should be possible to specify supply and demand functions as a function of prices, income, technology, income distribution and preferences in a routine way.

provide the link between decisions about cash cropping as influenced by prices for both cash and food crops and food gifts (Title II, take home foods), and increased human capital through increased market wages and efficiency in household production. As the value of time increases as a result of these factors, household output might increase and alter the demand for nutritional well-being, depending on whether household preferences were skewed towards leisure or basic needs.

The model tested the response of food consumption (measured in calories by a 24-hour recall method) and nutritional status (weight for age indicator of the youngest child in each household) to various exogenous variables or changes in policy. A higher price for rice would lead, in rice producing households, to reduced calorie consumption and nutritional status; increases in the wage rate of males and females were positively related to these variables. Higher support prices for crop output appear to shift a household's food consumption from its own produce to market food, increasing food expenditure but decreasing calorie intake. The main policy conclusion of Franklin and Harrell is that the positive and usually rising opportunity cost of human time is a crucial element in the transition between subsistence food production and cash crop, as the process frequently implies higher real food costs to the former subsistence households, through two mechanisms. The first is the possibility of reduced local food supplies and the second is that higher value alternative uses for time will make home produced food costlier. Both point to improving market mechanisms for food supplies to cash crop areas.

General conclusions from these different approaches are clouded by the many different circumstances and assumptions. All crops have the potential to be cash crops, and usually are (even crops (a) in footnote 2). It is easier to analyse the effects of a stereo type cash-export crop which has a very limited number of income effects at both household and national levels (i.e. crops (c) in footnote 2). Two general points stand out. First, economic policy factors relating to price, marketing and transportation cannot be separated from the nature of the crop — its range of products, maturation period and so on. Second, understanding the ways in which these factors and changes in them at national level affect processes within different types of households is clearly a priority, albeit a very demanding one.

II. Cash Crops and Nutrition: Review of Evidence

The results of a dozen or so studies (there must be some that have been omitted, including some of plantation agriculture which do not appear here) are

shown in Table 2. This is an expanded version of the table drawn up by von Braun and Kennedy (1986), to whom thanks are due. Some of the problems in assessing the results have been described already. Results of these studies when compared as a group show no clear outcome. Also, the cash crops shown in Table 2 are all export crops, and so do not tally with the broader definitions of cash crops used elsewhere. There are more research results on the impact on nutritional status than on family food consumption, the reason for this being, presumably, that it is easier, having identified farmers as being cash crop growers or not, to measure the nutritional status of their children, rather than go through complicated and possibly inaccurate food consumption surveys. The latter tell us more about the impact of cash crops on nutrition than nutritional status, but involve far more research resources.

Few of the studies have controlled for other variables such as mother's educational level, family size and income level, or time period since crop adoption or since major entry into the market with it. The latter is especially important because in many cases the adopters of cash crops may already be better off, so effects on real income are difficult to identify.

Kenya and coffee have been the favourite areas of study; there was a large FAO research project there in 1980 and also repeated data collection by the Rural Child Nutrition Surveys, linked to the Integrated Rural Surveys. Logically, these favourites could give rise to questions such as: Does Kenya provide a policy environment which minimised malnutrition among the children of coffee growers? Or, why does coffee as a crop become associated with malnutrition? Neither question could be answered properly on the basis of these data, although coffee comes out positive in six out of eight cases, the two negatives being in surveys with a very small sample size [Lambert 1978] and the mildest of statistical significance [Haaga *et al.* 1986]. As will be suggested in the next section, there are many *a priori* reasons why coffee should be associated with poor nutrition. On the other hand, the two surveys of coffee in Papua New Guinea give different effects. Other general results from the table are that both cocoa and sugar come out negative.

Several researchers have pointed out the value of 'no finding', i.e. that despite having higher incomes, more assets, etc., the children of cash crop farmers do not have better nutritional status than the children of non-growers. This is an important point in the FAO study on tea in Kericho, Kenya [FAO 1984], based on data collected in 1979, where there was no significant difference in nutritional status indicators of children in families of tea and non-tea growers, despite the former having more cattle, higher nominal farm incomes and per capita farm area and maize consumption. The conclusion to draw here is that the

Table 2

Summary of Studies on the Impact of Cash Crops on Household Food Security and Nutrition

Study	Country	Crop	Effects on:	
			Family Food Consumption	Nutritional Status
Collis, 1962	Nigeria	Cocoa	n.a.	Negative
Dewey, 1979	Mexico	Cocoa	n.a.	Negative
Fleuret and Fleuret, 1983	Kenya	Coffee Vegetables	n.a.	Positive
FAO, 1984	Kenya	Tea	n.a.	Neutral
FAO, 1984	Zambia	Cotton	n.a.	Neutral
Gross and Underwood, 1971	Brazil	Sisal	Negative	n.a.
Haaga <i>et al.</i> , 1986	Kenya E. Province	Coffee	n.a.	Negative
Harvey and Heywood, 1983	Papua New Guinea	Coffee	Positive	Positive
Hernandez <i>et al.</i> , 1974	Mexico	Cocoa Sugarcane	n.a.	Negative
Hitchings, 1982	Kenya	Tea Coffee Cotton Pyrethrum Sugarcane	n.a.	Positive Positive Neutral Neutral Negative
Keller, Muscat and Valder, 1969	Kenya	Coffee and Pyrethrum	Positive	Positive
Lambert, 1978	Papua New Guinea	Coffee	Negative	n.a.
Lev, 1981	Tanzania	Coffee and bananas	Positive	n.a.
Rabeneck, 1982	Kenya	Coffee and Staples	n.a.	Positive

n.a. Issue not addressed

Source: Expanded from von Braun and Kennedy, 1986.

extra wealth of tea-growing families was not translated into improved nutritional status for their children. The group of families growing tea which was also growing maize had a lower risk of poor nutritional status than those growing only tea, a finding confirmed by other studies in Kenya.

The time of adoption of the crop and choice of nutritional status indicator may have been important in the finding of the FAO study in Kalichero and Luangwa Valley in Zambia that there was no difference in the incidence of malnutrition in respect of cropping patterns, i.e. the proportion of food crops (maize and sorghum) to cash crops (cotton). There were differences in malnutrition according to location, i.e. families farming on the plateau had a higher incidence than those in the Valley. Children of families growing cotton and maize had a higher incidence of low weight for age compared to sorghum growers, but the incidence of low height for age was higher in maize than sorghum or cotton farmers. In such circumstances the cropping pattern may not have been a key determinant of malnutrition. However, cotton was being rapidly adopted at the expense of land area devoted to sorghum and maize. A survey carried out now, some eight years on, may find cropping choice an important indicator of malnutrition. The situation obviously calls for some careful research that controls for a wide range of cross-section variables and is

carried out on a suitable time-scale³ with the impact of different national policies carefully considered.

III. Worst and Best (or Better) Case Scenarios

Given the many different strands of analysis and evidence presented so far and the emergent state of theory and modelling, it might be useful to present simple lists of 'good' and 'bad' factors of cash crops in terms of their impact on household nutrition, which could be amalgamated into 'worst case' and 'best (or better) case' scenarios. These are summarised in Table 3.

The worst case scenario means that a 'wicked' crop is introduced under 'wicked' government policies; it may be a non-food export crop such as cotton, cocoa, coffee or eucalyptus; it is backed up with a comprehensive research, extension and marketing service which ignores all food crops; inputs may be subsidised to the exclusion of staple crops; it may have only one marketable product and there is only one official marketing outlet — the State Marketing Board; it may take several cropping seasons to mature and revenues from it are 'lumpy', i.e. come all at one period in the year; the crop is traditionally a man's crop — he controls income and all attention is focused on his activities; the crop clashes with established farming practice in terms of factors such as rotations and labour peaks; national food markets are poorly integrated. These features lead to the following

³ IFPRI is carrying out some much-needed and detailed research in the area.

Table 3

Characteristics of Cash Crops for 'Bad' and 'Good' Outcomes

<i>Characteristics</i>	<i>Bad</i>	<i>Good</i>
A. Physical		
Composition	Non food	Food
Marketable products	One	Several
Maturation period	Long	Short
Within the farming system	Competitive	Complementary
Processing	Not done locally	Locally done
B. Household Organisation		
Gender control	Men	Men and women
Income flow	Lumpy	Spread out
Impact on landless and off-farm industries	None	Some
C. Regional or national policy		
Marketing outlet	One	Several
Research and extension	Focussed on crop	Recognises farming system
Food markets	Poorly integrated	Well integrated
Incentive price impact	Disruptive	Recognises multi-products of farm

scenario:

Land area is transferred from food crops to the cash crop under the weight of monocrop incentives. This land may have been used to grow family subsistence crops. Poor markets mean less food available and food prices rise. The landless get no income benefits but face higher food prices. Within the family women have a smaller area for producing crops (if they participate in food production) and may have a heavier workload (extra search costs, cultivating on poorer or more remote land) if food prices have risen; the men may not be obliged to pass on the extra income from cash crops, depending on the structure of the society. The net employment effects on the landless could be negative if the cash crop has a mechanised package. The energy terms of trade within the food producing household could worsen. Some crops bring extra health risks if, for example, irrigation is required.

This 'worst possible' scenario has been the subject of much qualitative evidence and some quantitative, and is well documented from some settlement schemes [e.g. Hanger and Moris, 1973]. It has also sprung from a great deal of well-founded but anecdotal evidence. What we cannot judge when trying to evaluate this evidence is how important the cash crop is as an income source, and whether it is the crop or government policies that are the cause. The characteristics of the crop abandoned may be as important as those of the one adopted. The observation was made at the IDS cash crops workshop (see *Editorial*) that in Botswana, cattle as a cash crop fulfil all the negative aspects. However, they generate so much income that the negatives are overcome; therefore *size* of income is a determinant.

The 'best (or better)' case scenario means that a 'good' crop is introduced within 'benevolent' government policies. The cash crop may also be a food crop, and as such can contribute directly to the diet (although it could drive out more nutritious foods, especially if it is an additive, such as sugar). It may be multipurpose, having local uses other than sale for export, and so its benefits can be 'leaked' to non-cultivators; net employment increases may be generated. Cash payments from the crop may be spread throughout the year, as in the case of tea. Both men and women have access to the benefits of the crop and it complements the existing farming system. Research and extension services recognise the role of the crop within the system, food markets are well integrated and price policy does not create such incentives as to lead to massive adoption at the expense of staple crops (e.g. the apparent complementarity between price policy for rice and millet in Senegal — see Josserand 1984).

Most of these 'good' attributes could be ascribed to crops that are grown for household consumption and

then go into marketable surplus as a result of innovation, changes in incentives or good weather. When this happens there is not the same degree of disruption as with a crop that is introduced as a separate activity. One example of a 'good' export crop might be groundnuts in The Gambia. Groundnuts contribute significantly to both calorie (21 per cent of total) and protein intakes (24 per cent of total) in the post harvest season [IAI 1982]; as energy-dense snacks, groundnuts find additional local markets; there is employment for women in oil extraction; and the haulm can be used for livestock feed. There may be indirect benefits for child nutrition through the women's increased income. However, rates of child malnutrition in rural Gambia are not significantly different from elsewhere in West Africa [Longhurst 1985].

On the basis of these typologies, can predictive statements be made that some types of cash crops are more likely to have a positive impact on food security and nutrition without an overlay of compensatory devices, which may be costly and administratively infeasible? For example, is a crop that is a food, has several products, a short maturation period, that fits into existing cropping patterns and is easily stored going to require fewer additional measures (such as incentive price, food-for-work schemes, child care facilities, nutrition education) than one which is the obverse of these? Further, is a crop introduced into households where 'good' factors exist, such as a role for women in farm decision-making, and into societies where marketing systems are efficient, also going to mean a favourable impact on food security? How far can impacts be predicted on the basis of the physical or agronomic characteristics of the crop alone?

IV. Conclusion

Most of the answers to the questions raised will be specific to very local situations. However, the check lists or typologies described and proposed here should help knowledgeable local officers to plan for the introduction of cash crops without disruptive effects. The argument to advance should be that the equitable introduction of cash crops will have both efficiency and equity benefits: that the adoption and spread of a cash crop for national advantage in terms of foreign exchange generation will be accelerated if local interests for secure food supplies at the household level are upheld.

References

- Boserup, E., 1970, *Women's Role in Economic Development*, George Allen and Unwin, London
- Collis, W., 1962, 'On the ecology of child health and nutrition in Nigerian villages', *Tropical and Geographical Medicine*, 14 pp 140-63; 201-28
- Dewey, K., 1979, 'Agricultural development, diet and nutrition', *Ecology of Food and Nutrition* vol 8 pp 265-73
—1981, 'Nutritional consequences of the transformation from subsistence to commercial agriculture in Tabasco, Mexico', *Human Ecology* vol 9 no 12 pp 151-87
- Evenson, R., 1978, 'Time allocation in rural Philippine households', *American Journal of Agricultural Economics* vol 60 no 2, pp 322-30
—1981, 'Food policy and the new home economics', *Food Policy*, vol 6 no 3, pp 180-93
—B. Popkin and E. King-Quizon, 1980, 'Nutrition, work and demographic behaviour in rural Philippine Households: a synopsis of several Laguna household studies', in H. Binswanger, R. Evenson, C. Florencio and B. White (ed), *Rural Household Studies in Asia*, Singapore University Press, Singapore
- FAO, 1984, 'Integrating nutrition into agricultural and rural development projects: six case studies', *Nutrition in Agriculture* No. 2, Rome
- Fleuret, P. and A. Fleuret, 1980, 'Nutrition, consumption and agricultural change', *Human Organisation* vol 39, no 3, pp 250-60
—1983, 'Socio-economic determinants of child nutrition in Taita, Kenya: a call for discussion', *Readers Forum* vol 8
- Franklin, D. and M. Harrell, 1985, 'Resource allocation decisions in low-income rural households', *Food Policy*, vol 10 no 2, pp 100-8
- Gross, D., and B. Underwood, 1971, 'Technological change and calorie costs: sisal agriculture in Northeastern Brazil', *American Anthropologist*, 73, p 725
- Haaga, J., J. Mason, F. Omoro, V. Quinn, A. Rafferty, K. Test, and L. Wasonga, 1986, 'Child malnutrition in rural Kenya: a geographic and agricultural classification', *Ecology of Food and Nutrition*, vol 18, pp 297-307
- Hanger, J. and J. Moris, 1973, 'Women in the household economy', in R. Chambers and J. Moris (eds.), *Mwea: An Irrigated Rice Settlement Scheme in Kenya*, Afrika Studien, Munich
- Harvey, P. and P. Heywood, 1983, 'Nutrition and growth in Simbu, Vol 4, Papua New Guinea', Simbu Provincial Government, Office of Environment and Conservation
- Hernandez, M., C. Hidalgo *et al.*, 1974, 'Effect of economic growth on nutrition in a tropical community', *Ecology of Food and Nutrition*, vol 3, 283-91
- Hitchings, J., 1982, 'Agricultural Determinants of Nutritional Status among Kenyan Children with Model of Anthropometric and Growth Indicators', PhD thesis, Stanford University
- International African Institute, 1982, 'Village Food Systems in West Africa', London (mimeo)
- Jakobsen, O., 1978, 'Economic and Geographical Factors influencing Child Malnutrition', *BRALUP Research Paper No. 52*, University of Dar es Salaam, Tanzania
- Josserand, H., 1984, 'Farmers' consumption of an imported cereal and the cash/food crop decision: An example from Senegal', *Food Policy*, vol 9 no 1
- Katona-Apte, J., 1983, 'A Sociocultural Perspective of the Significance of Sex Roles in Agriculture', in IFAD, *Nutritional Impact of Agricultural Projects*, Rome
- Keller, W., E. Muscat and E. Valder, 1969, 'Some observations regarding economy, diet and nutritional status of Kikuyu farmers in Kenya', in H. Kraut and H-D Cremer (eds.), *Investigations into Health and Nutrition in East Africa*, Ifo-Institut für Wirtschaftsforschung, Afrika-Studien No. 42, Munchen
- Kumar, S., 1977, 'Role of the Household Economy in Determining Child Nutrition at Low-Income Levels: A Case Study in Kerala', *Cornell University Occasional Paper No. 95*. Ithaca
- Lambert, J., 1978, 'Does Cash Cropping Cause Malnutrition?' National Planning Office, Port Moresby, Papua New Guinea
- Lev, L., 1981, 'The effect of cash cropping on food consumption adequacy among the Meru of Northern Tanzania', *Working Paper* No. 21, Michigan State University, East Lansing
- Longhurst, R., 1985, 'Cropping Systems and household food security: evidence from three West African countries', *Food and Nutrition*, vol 11 no 2, pp 10-16
- Pinstrup-Anderson, P., 1983, 'Export crop production and malnutrition', *Food and Nutrition* vol 9 no 2, pp 6-14
- Popkin, B., 1980, 'Time allocation of the mother and child and nutrition', *Ecology of Food and Nutrition* vol 9, pp 1-14
- Rabaneck, S., 1982, 'The Determinants of Protein-Energy Malnutrition among Preschool Children in Kenya with Respect to Cash Cropping and Self Sufficiency in Staple Food Production', PhD thesis, Cornell University, Ithaca
- Schofield, S., 1979, *Development and the problems of Village Nutrition*, Croom Helm, London
- von Braun, J., and E. Kennedy, 1986, 'Commercialisation of Subsistence Agriculture: Income and Nutritional Effects in Developing Countries, IFPRI, Washington DC